N°. VII.

Obfervations on the probabilities of the Duration of Human Life, and the progrefs of Population, in the United States of America ; in a Letter from WILLIAM BARTON, ESQ. *to* DAVID RITTENHOUSE, L. L. D. *Prefident,* A. P. S.

DEAR SIR,

Read Mar. 18, 1791.

I BEG leave to communicate to our Philofophical fociety, the following obfervations, *on the probabilities of the duration of human life, in this country ;*—and, likewife, *on the progrefs of its population ;* together with the caufes which accelerate that progreffion, in a degree unparalleled elfewhere. By comparing the refults, with fimilar eftimates made for fome European countries—the advantages on the fide of the United States, in thefe refpects, will be readily difcerned.

There is not, perhaps, any political axiom better eftablifhed, than this,—That a high degree of* population contributes greatly to the riches and ftrength of a ftate. In fact, the progreffive increafe of numbers, in the people of any civilized country, is reciprocally the caufe and effect of its real wealth : and, therefore, there cannot be a furer criterion by which we may judge, whether a nation be, in reality, on the rife or on the decline, than by obferving, whether the number of its inhabitants increafe or diminifh.

If, then, numbers of people conftitute (or, at leaft, contribute to) the ftrength and riches of a ftate ; that country, whofe population is rapidly advancing, may fairly be faid to be increafing in both thefe concomitants of national profperity, with proportionable celerity. For, if a country exhibits fo unequivocal a teft of ftrength and

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* " The encouragement of population ought to be one of the firft objects of policy, in every State." Dr. Price.

riches, as that circumſtance indicates,---a good ſyſtem of government, well adminiſtered, muſt inſure its proſperity (ſo far as human efforts can produce the end;) notwithſtanding the tranſitory effect of ſuch incidents, as have no neceſſary connection with, or permanent influence upon, the fundamental ſources of a nation's welfare : Theſe could only occaſion a temporary derangement in the political œconomy of the ſtate, whereby the operation of the national reſources might, for a time, be ſuſpended ; during which interval there might be an appearance (or even an actual exiſtence, in ſome degree,) of public debility and diſtreſs.

If theſe obſervations be applied to the United States of America, it will appear, that this country poſſeſſes, in a ſuperior degree, an inherent, radical and laſting ſource of national vigor and greatneſs :---For, it will be found, that, in no other part of the world, (at leaſt, in none of thoſe parts with which we are beſt acquainted) is the progreſs of population ſo rapid, as in theſe ſtates.---And this increaſe ariſes from the ſalubrity of the climate ; the great fruitfulneſs and reſources of the country ; the conſequent facility of acquiring the means of a comfortable ſubſiſtence, which, aided by the benign influence of our government, produces * early marriages ;---and, laſtly, from the†‡ virtuous and ſimple manners of the great body of our inhabitants. Theſe are either the proximate or remote cauſes which accelerate the population of this favoured land ; independently of acceſſions to our numbers, occaſioned by migrations from foreign countries.   As

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* In a letter written in the year 1768, by our venerable Franklin, to John Alleyne ; Eſq. (in anſwer to one wherein Mr. Alleyne had requeſted to know the Doctor's impartial thoughts, on the ſubject of an early marriage,) there is this paſſage.—" With us in America, marriages are generally in the morning of life,—our children are therefore educated, and ſettled in the world, by noon ; we have an afternoon and evening of chearful leizure to ourſelves,---ſuch as your friend at preſent enjoys. By theſe early marriages, we are bleſt with more children ; and, from the mode among us---founded in nature---of every mother ſuckling and nurſing her own child, more of them are raiſed. Thence the ſwift progreſs of population, among us,--- unparalleled in Europe !"

† " A nation ſhall be more populous, in proportion as good morals and a ſimplicity of taſte and manners prevail ; or, as the people are more frugal and virtuous."---Wallace's Diſſertation on the numbers of mankind, in ancient and modern times.

As a plenitude of inhabitants is of fo much importance to the interefts of a nation, numerous eftimates have been made, of the ftate and progrefs of population in divers countries; and the circumftances are defignated which occafion its growth or ·declenfion, in different places and at particular feafons.   The refults of ‡ eftimates, on this fubject, furnifh ufeful reflections to a contemplative mind: they are not only inftructive to the moralift and pleafing to the mere fpeculative philofopher; but they are peculiarly interefling to the ftatefman and the medical enquirer.

In order to fhew the difference between the progrefs of population in this country, and that in fome parts of the old world, as well as in the probabilities of the duration of life in each, refpectively,—I fhall offer fome remarks from fuch *data*, as, I prefume, will be fatisfactory on the occafion.   Although the kind of documents, on which calculations of this nature are ufually founded, could not, in relation to this country, be obtained in fo perfect a ftate, as to warrant very accurate inferences from them, in *every* particular,—the deductions, in general, are neverthelefs not far from the truth.—It is greatly to be wifhed, that the feveral religious denominations of chriftians, throughout the United States,—at leaft, in our confiderable towns and well fettled parts of the country,--would be at the pains of obtaining and publifhing, every year, lifts of the births and deaths in their refpective parifhes or congregations; together with the proportion of the fexes in each lift, the ages of the deceafed, their difeafes, and the numbers dying in each month.   The number of marriages fhould alfo be added: and it would, moreover, be ufeful

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‡ " La population eft un des plus fûrs moyens de juger de la profpérité d'un empire ; et les variations q'elle éprouve, comparées aux évènemens qui les precèdent, font la plus jufte mefure de l'influence des caufes phyfiques et morales, fur le bonheur on fur le malheur de l'efpèce humaine."---See a paper on the births, marriages and deaths, at Paris, &c. by M. de la Place, Hift. Royal read fciences, for 1783.

" La connoiffance des probabilities de la durée de la vie, eft une des chofes les plus interef- fantes dans l'hiftoire naturelle de l'homme."---See M. de Buffon's effay on the probabilities of the duration of life---in the fupplement to the Nat. Hiftory.

to notice in what inftances thofe dying after eighty years of age were foreigners. But a laudable fpirit of enquiry is gaining ground among us, fo faft, that there is reafon to expect the introduction of great regularity and precifion in fuch arrangements, in the feveral departments of our public œconomy, as may lead to further attainments in ufeful knowledge, and particularly to improvements in this branch of fcience.

In purfuing this fubject, it becomes neceffary to ftate thofe facts, from which, as *data*, deductions are ufually made, for the purpofe of afcertaining the condition of any given country, with refpect to its population. And, after fhewing the refult of fimilar ftatements, here, and comparing them with fuch as have been made the ground-work, in eftimates relating to European countries, the balance in favor of this country will be evident.

Marriage is the fource of population. Therefore, the greater is the proportion of marriages in any country, the greater will be its proportion of births.—It appeared, by a collection of the yearly bills of mortality, publifhed in London, in 1759, by Mr. Corbyn Morris,—that, in *England*, each marriage produces four children. Dr. Short, in his comparative hiftory of the increafe of mankind, fays, that, in order to be fully fatisfied refpecting the numbers of perfons to be allowed to a family, he obtained the true number of families and individuals in fourteen market-towns, fome of them confiderable in trade and populoufnefs; and that they contained 20,371 families, and 97,611 individuals;—or, but little more than $4\frac{3}{4}$ to a family. He adds, that, in order to find the difference in this refpect, between towns and country-parifhes, he procured, from divers parts of the kingdom, the exact number of families and individuals, in fixty-five country-parifhes. The number of families was 17,208,—individuals, 76,284; or, not quite $4\frac{1}{4}$ to a family. Dr. Davenant,

Davenant, from the obfervations of Mr. King, gives $4\frac{1}{13}$ as the number of perfons to a family, *for the whole king-dom.*——By the ftate of births, marriages and deaths, in the city and Fauxbourgs of Paris, from 1771 to 1784 (both inclufive,) each marriage produced the proportion of $3\frac{93}{100}$ births.   The marriages and births at Paris, for 22 years (viz. from 1745 to 1766, both inclufive) as ftated by the Count de Buffon, give the proportion of $4\frac{36}{100}$ births to a marriage.   But M. Buffon fuppofes, that about one half the foundlings (les enfans trouvès) ought to be included in the lift of births for that city; inftead of their whole number, which averaged, during thofe twenty-two years, 4,509 per annum : deducting, therefore, one half of the foundlings from the total number of births, and each marriage gives the proportion of $3\frac{84}{100}$ births.   The Abbè D'Expilly has given a ftatement of the births, deaths and marriages for the whole kingdom of France, including Lorraine and Bar, from 1754 to 1763, comprehending a term of nine years; and likewife one for France, exclufive of thofe provinces, during the fame term.   By *both* thefe ftatements it appears, that each marriage gives the proportion of $4\frac{1}{2}$ births, for that kingdom.——In the Pais de Vaud, in Switzerland, on a medium of ten years, the proportion of marriages to births, was—as 1 to $3\frac{9}{10}$. According to Dr. Price, the proportions of marriages to births are, at Berlin, 1 to $3\frac{93}{100}$—at Copenhagen, 1 to $3\frac{5}{100}$—and at Amfterdam, 1 to $1\frac{92}{100}$.—In the Ifland of Corfica, indeed, during the years 1781 and 1782, there were five births to a marriage, according to the tables of births, deaths and marriages, within the French Dominions in Europe——(publifhed by M. de la Place, in the memoirs of the Royal Academy of Sciences for 1783.) But this is a folitary inftance of fo large a proportion of births to marriages : and, being for a fmall ifland, fcarcely containing 129,000 inhabitants, it is not proper to take it into an eftimate, on this occafion.   From

From the foregoing ftatements it may be prefumed, that four and an half perfons to a houfe, and the fame proportion of births to a marriage, are an allowance quite high enough for fome of the healthieft parts of Europe, comprehending a large extent of territory.—There is but one inftance, in which I have been enabled to obtain the actual proportion of marriages to births, in this country—At the firft parifh in Hingham, in the ftate of Maffachufetts, during the courfe of fifty-four years, there were two thoufand two hundred feven and forty births, one thoufand one hundred and thirteen deaths, and five hundred and twenty one marriages; which gives the proportion of fix and a quarter births to a marriage. If the number of inhabitants in this parifh had remained ftationary, during the whole term of fifty-four years,—and if one out of forty-five had died there, annually ; it would have contained nine hundred and twenty-feven fouls—Therefore, the proportion of births to marriages, in that parifh, being taken out of fo confiderable a number of perfons, and for fo long a time, inclines me to think it may ferve as a pretty juft ftandard for the country parts of the northern, and, perhaps, of the middle ftates.—But, not being poffeffed of documents of this kind, for other parts of the Union, I fhall affume the proportion of perfons to a houfe, or to a family, as the next beft means for afcertaining the proportion of births to marriages.—When we find a large proportion of perfons to a family, taking a country *en gros*, it may be reafonably prefumed that the births are numerous in the fame ratio: And the moft obvious caufes, which produce this effect, have already been noticed. It has been obferved, that, in fome of the healthieft and moft confiderable portions of Europe, four and an half perfons to a houfe is a large allowance for thofe countries. The late cenfus of the inhabitants in the ftate of Maffachufetts fhews, that there are in that ftate, upwards of five and

two

two thirds fouls to a *family*, in that ftate---exclufive of Indians and Negroes—The proportion to a *houfe* is $6\frac{85}{100}$: For, the *families* are to the *houfes*, in that ftate, as fix to five. In Bofton, there are to a *family*, $5\frac{39}{100}$ fouls: and in the three next largeft towns, placed in the order of their magnitude, the proportions of perfons to a family, are as follow, viz. Salem, $5\frac{30}{100}$, Marblehead, $5\frac{12}{100}$ Newbury-Port, $4\frac{84}{100}$: At Ipfwich, containing four thoufand five hundred and fixty two inhabitants (and which will be mentioned hereafter,) the proportion is, $5\frac{6}{100}$. In this eftimate for Maffachufetts, the diftrict of Maine is not included: but the ftate contains 373,324 inhabitants, exclufive of that diftrict.—When the cenfus in completed, for the feveral ftates in the Union, the refult it will furnifh, on this fubject, will prove highly interefting—It appears, however, by the cenfus for the large and populous ftate of Maffachufetts, that the proportion of births to marriages, there, greatly exceeds that which obtains in fome of the principal countries of Europe: And, it is probable, the refult will be found nearly the fame, in this particular, with relation to the major part of the Union.

There is, however, another means, by which the fuperior number of births in proportion to the whole number living, in this country,—compared with the proportion which obtains, in this refpect, in profperous European countries,—may be afcertained.—In an effay for afcertaining the population of France, by Meffrs. Du Sejour, the Marquis De Condorcet and De La Place, (in the memoirs of the Royal Academy of fciences for 1783,) it is affumed as an hypothefis---that multiplying the medium of annual births in the whole kingdom, by $25\frac{1}{2}$, will give the number of inhabitants; and that, for the cities of Paris and Verfailes, thirty muft be the multiplier. The Count De Buffon fuppofes, that the number of thofe who die in France, annually, is $\frac{1}{35}$ of all the living; and, confequently

quently, if the medium of annual deaths in the kingdom
be multiplied by thirty five, the product will be the num-
ber of inhabitants it contains---Accordingly, by the firſt
hypotheſis, France ſhould contain 24,812,877 inhabitants
(taking the medium of births in that kingdom, excluſive
of Corſica, in 1781 and 1782,---as ſtated in the mem-
oirs of the Royal Academy of Sciences, for 1783):—And
by the ſecond hypotheſis, the number would amount to
25,916,170, (taking the medium of deaths in nine years,
viz. from 1754 to 1763,---as ſtated by the Abbè D'Ex-
pilly.) The variance in the reſult of theſe two hypotheſes
ſhews, that both cannot be juſt.—I am induced to believe
that the ſecond proportion approaches neareſt the truth,
for the following reaſon---Each marriage gives four and
an half births, during the nine years eſtimated by the Ab-
bè D'Expilly; whereas the ſame gives only the proporti-
on of $4\frac{23}{100}$ births, for the years 1781, and 1782,—as
ſtated by M. de la Place: and it may be preſumed, that
the longeſt term gives the trueſt proportion. If, therefore,
the proportion of births to marriages from 1754 to 1763
(the laſt, included,) compared with the proportion of births
to marriages, in 1781 and 1782, be admitted as a _Dat-_
_um,_ from which any probable eſtimate of the number of
inhabitants in France may be deduced, for the latter pe-
riod,—that number would be 26,396,667; which exceeds
the higheſt number above ſtated. But $4\frac{1}{10}$ births to a
marriage—an intermediate ratio—will give the number of
inhabitants the ſame, as thirty five of the whole number,
living in a given term, to each death during the ſame time;
and this accords with M. de Buffon's hypotheſis.---Aſſum-
ing, then, the truth of this poſition---there are in France
$26\frac{63}{100}$ perſons living, in proportion to each birth—Hence
the number of annual births in that kingdom, multiplied
by $26\frac{63}{100}$, will yield the number of its inhabitants.---It ap-
pears, alſo, by an enumeration of the inhabitants of the
kingdom

kingdom of Naples, taken in the year 1769,---that by multiplying, by twenty-five and an half, the births of a common year, in that kingdom, the product gave the real number of the inhabitants: and, further, that, on comparing the number of births and that of the inhabitants, in the city of Turin, in the years 1767 and 1768,---the proportion of the former was to the latter, as one to twenty-seven.---Confidering thefe feveral circumftances, I would infer---that the proportion of about twenty-fix and an half exifting perfons to each birth, is nearly right with reference to France. In this eftimate for France, the Ifland of Corfica, fubject to that crown, is not comprehended.---If there be one birth to every twenty-fix and an half inhabitants, in that Ifland,---the latter muft amount to 136,077; and, if this number be divided by the medium of annual deaths,---thefe will be to the whole number of the living, as one to $32\frac{71}{100}$. But, taking the medium of marriages and births, refpectively, for Corfica, there were five births for one marriage. For this reafon, a greater number ought not to be affumed, for afcertaining the actual population of that Ifland, than twenty-five perfons to each birth. This reduces the total number of inhabitants to 128,375; and makes the number of thofe who die annually, compared with the whole number living, as one to $30\frac{86}{100}$: a degree of mortality, which indicates the unhealthinefs of the climate; notwithftanding the high proportion of births to marriages, in that country, makes the number of deaths appear low, in comparifon with the births.------

With refpect to England—although Sir William Petty and other Englifh writers agree in faying, that, in the *country* in that kingdom, there dies one in thirty-two,--- M. Buffon eftimates the proportion to be one in thirty-three. And Petty fuppofes that five are born, to four that die, in that country.---This ratio gives one birth to nearly twen-

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ty-fix and an half inhabitants.---Dr. Price prefumes, that
591,580, is nearly the true number of inhabitants, in
London; but, that 651,580, though fhort of the number
fuppofed in that city, is very probably greater, and can-
not be lefs, than the true number.—In the firft cafe, the
number of inhabitants in London, divided by the annual
number of deaths (including therein an addition of 6,000,
for omiffions,) gives $21\frac{62}{100}$, as the proportion out of which
one dies annually:—and, in the fecond cafe, that pro-
portion will be one out of $23\frac{80}{100}$. There are, notwithftand-
ing, fome circumftances, which difpofe me to conclude,
that London contains 711,516 fouls---Firft; we find, by
taking the medium of two eftimates (one by Meffrs. du
Sejour, Condorcet and de la Place, and the other by M.
Buffon,) that Paris contains about 626,285 fouls, and
that there are nearly thirty-two and an half living in that
city, to each annual death.—We alfo find, that the mor-
tality of London exceeds that of Paris, about one fourth
part,—as eftimated from the births and deaths for each ci-
ty, refpectively: confequently, the number of perfons liv-
ing, to each annual death, in London, will be twenty-
fix; agreeably to my hypothefis---Secondly; although
Graunt, Petty, Morris, Smart, and other Englifh authors,
have adopted the number of thirty of the living, to each
death, for London; yet the Count de Buffon fuppofes---
that thirty-one to one, is near the truth: and Dr. Price
ftates the proportion to be twenty-one to one:---The me-
dium, therefore, of M. Buffon's and Dr. Price's eftimates
is twenty-fix to one. Now, if we affume the proportion of
one birth to twenty-fix inhabitants, annually, for France,
which is lefs favorable, with refpect to the ratio of births to
inhabitants in that kingdom, than the eftimate of M. du
Sejour, &c.---and, if it be affumed as a fact, that one in
twenty-fix dies, annually, in London; the proportions of
the births in a year, for the feveral places herein mention-
ed,

ed, are, to the number of fouls in thofe places, refpect-
ively, as follow, viz.

  In France——1 birth——to 26 inhabitants
  England——1 do.——to 26½ do.
  Paris————1 do.——to 30 do.
  London——1 do.——to 32½ do.

Yet, even in the city of Philadelphia, the annual births
amount to one in twenty-two and an half, of all the inha-
bitants. A bare infpection of the feveral proportions, in
this particular, will enable one to form a judgment of
the increafe of population in this country, beyond that of
the two moft confiderable in Europe.

Another circumftance, from which the extraordinary
progrefs of population, in this country, may be inferred,
is the high proportion of thofe under the age of 16 years,
to thofe above that age, out of the whole number of the
living.—Dr. Halley computes the number of the living,
under 16, to be but a *third* of all the living at all ages.
But it appears from the cenfus of the inhabitants of New-
Jerfey, taken by order of the government at two periods,
viz. 1738 and 1745, that, in the year 1738, the number
of thofe *under* 16, was to the whole amount, as $47\frac{63}{100}$
to 100; and, in 1745, the proportion was, as $49\frac{55}{100}$ to
100. The proportion of free white males, to the whole
number of perfons of that defcription, in Maffachufetts,
taken from the recent cenfus of inhabitants in that ftate,
is as $48\frac{2}{100}$ to 100.—Hence we find nearly * *one-half*, in-
ftead of one-third, is the proportion, here, of thofe un-
der 16, out of the total number of our inhabitants.—The
proportion for the city and fuburbs of† Philadelphia, is,
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* Mr. Jefferfon obferves—in his notes on Virginia—that, to find the number of free inha-
bitants in that ftate, it is to be noted—that thofe above and thofe below 16 years of age, are
nearly equal.
 † The celebrated founder of Pennfylvania, in a letter to his friends in London (dated at
Philadelphia, the 16th of Auguft, 1783)—acquaints them, that the planted parts of the pro-
vince were then erected into fix counties, containing about four thoufand fouls; and that the
capital had advanced, within lefs than a year, to about four fcore houfes and cottages, fuch as
they were.——Philadelphia *now* contains about 44,000 inhabitants!

by the cenfus,* $41\frac{88}{100}$ to 100 : but this inferiority of the proportion of perfons under 16 to thofe above that age, in Philadelphia, may be attributed to a greater proportion of children dying in large cities, than in country places. The next circumftance, from which I fhall infer that the progrefs of population is much more rapid in this country, than elfewhere, is, that the births exceed the deaths, in number, in a fuperior degree, among us.—The Abbè D'Expilly, in his eftimate before mentioned, gives the births to the deaths, in France, as 100 births to $76\frac{94}{100}$ deaths. In the Pais de Vaud, on an average of ten years, the proportion was, to 100 births, $79\frac{37}{100}$ deaths.——In great cities, the degree of mortality is much higher. By the tables of births and deaths in Paris, for twenty-two years (viz. from 1745 to 1766,) the births and deaths give the proportion of 100 of the former, to $99\frac{1}{4}$. The medium of four other ftatements (two by M. de la Place, one by Dr. Price, and the other taken from Anderfon's hiftorical and chronological deduction of the origin of commerce,) gives, for Paris, 100 births to 100 $\frac{99}{100}$ deaths : and the Count de Buffon fays, that, in fifty-eight years, the deaths in Paris exceeded the births only about $\frac{1}{75}$ part. This is a favorable proportion for fo great a city.—Mr. Anderfon has given the numbers of annual births and deaths in London, during a term of twenty-fix years ; from which it is found, that the deaths exceed the births, in that city, at the rate of five to four, very nearly. This ftatement, which gives the proportion of births, in London, rather higher than others, fhews, that the mortality of that city is about one-fourth greater, than that of Paris. At Amfterdam and Berlin, according to Dr. Price, the degree of mortality is ftill higher than in London ; there being, in the former, to 100 births $169\frac{56}{100}$ deaths, and in the latter, to 100 births 131 deaths. In the city of Norwich, Great-Britain, on a medium of thirty years, there

there were, to 100 births, $114_{\frac{4}{100}}$ deaths—That city is fuppofed to contain about 33,000 inhabitants. And at Breflaw, which contains about as many inhabitants as Philadelphia, the births are to the deaths (taking the medium of two ftatements) as 100 births to $119_{\frac{1}{4}}$ deaths. The proportions of births to deaths vary, in different countries; and, in large towns, the proportion of the latter is always higher than in country places, *cæteris paribus*. But, taking the principal countries of Europe, *en gros*, the births do not exceed the deaths in any great degree—I have fubjoined a fcale of thefe proportions, for feveral cities and countries, not enumerated in the foregoing ftatements.

The births (eftimated from the *chriftenings*) in Philadelphia, in the year 1788, were 1583; and the burials, exclufive of negroes, amounted to 872. The number of negro births for this city, as appears by the bills for the years 1789 and 1790, average 144 *per annum*. Suppofing one-third of this number to be included in the *chriftenings*, forty-eight muft be deducted from the lift of births. This will give 1536 births, to 872 deaths, for the year 1788 :—and, taking the average proportion of births to deaths, for four years, it gives to 100 births, $56_{\frac{1}{2}}$ deaths. The average number of deaths, among *all* the *white* inhabitants of this city, for the three laft years, is 924 *per annum*. The proportion of births to deaths, in the German Lutheran congregation of this city, which comprehends about one-fifth of all the white inhabitants, is, on an average of* fixteen years, as one hundred births to forty-five deaths : and therefore, taking the medium of this proportion and that above ftated, it gives to 100 births, $50_{\frac{1}{4}}$ deaths. The bills, for the white inhabitants in this city, for 1789 and 1790, give the proportion as only 100 births to $49_{\frac{9}{100}}$ deaths; and, as thefe bills are the moft ful!

* The Rev. Dr. Helmuth, rector of the German Lutheran church, in Philadelphia, was fo obliging as to furnifh me with thefe lifts.

full and fatisfactory of any I have yet feen, for Philadel-
phia, I think the births may be fairly ftated as being dou-
ble to the number of deaths.—At Salem in Maffachufetts,
on a medium of the years 1782 and 1783, the births were
to the deaths, as 100 births to 49 deaths, including the
ftill-born in the number of deaths.—Dr. Holyoke fays
(in the memoirs of the American Academy of Arts and
Sciences, Bofton,) that both 1782 and 1783 were fickly
at Salem ;—particularly the latter years, in which, during
the months of May and June, the meafles were epidemic.
The births and deaths at Hingham, in the fame ftate, dur-
ing 54 years, gives to 100 births 49$\frac{1}{2}$ deaths.———Hence
it may be inferred, that, fo far as deductions from thefe
documents may be relied on, there are two births to one
death, in this country.

The peculiar circumftances of this new country will
not permit me to afcertain, from the *data* ufually employ-
ed for fuch purpofes, the comparative longevity of our in-
habitants.—Agreeably to Dr. Halley's table for Breflaw,*
34 perfons, out of 1000, furvive 80 years of age. In the
paper on the longevity of the inhabitants of Ipfwich and
Hingham, in Maffachufetts (communicated to the Bofton
Academy, by the Rev. profeffor Wigglefworth,) the writ-
er obferves, that, out of 164 perfons who died at Ipfwich
Hamlet, in ten years, twenty-one perfons furvived eighty
years complete; being one in about eight: whereas, at
Breflaw, the proportion is one in about thirty—He alfo
ftates, that, out of 1,113 deaths in 54 years, at Hingham,
84 perfons furvived 80 years complete; being one in 13$\frac{1}{4}$.
It is obferved by Mr. Morfe, in his American Geography,
that the ftate of Connecticut, though fubject to the extremes
of heat and cold, in their feafons, and to frequent, fudden
changes, is very healthful. He fays, that as many as one in
46

* This does not, however, by any means, correfpond with M. Buffon's eftimate; as he makes the proportion to be only 27 63-100 out of 1000.——

46 of the inhabitants of Connecticut, who were living in 1774, were *upwards* of feventy years old : and that it is found, from actual calculations, that about one in eight live to the age of feventy years; one in thirteen, to the age of eighty; and one in about thirty, to the age of ninety years.—" From the 1ft January 1771, to the 1ft January 1777,---239 perfons died at Milford, (Connecticut;) of which thirty-three, or about one feventh part, were upwards of feventy years old---and eighty four. From Jan. 1ft 1771, to June 3d 1782, died at Milford, 417 perfons; of which, thirty-one (or about one thirteenth part of the whole number) were eighty years old, and upwards. Other calculations of a fimilar kind, continues Mr. Morfe, made in different parts of the fame ftate, from the bills of mortality, confirm the juftnefs of the above proportion."-- The number dying in Philadelphia, aged upwards of eighty years, during the year 1789, is in the proportion of about twenty-four and an half out of 1000 perfons. Thofe dying after that age, and upwards to the age of 101 inclufive, muft have been born between 1688 and the end of 1709. During this term of twenty-one years (commencing about fix years after the firft fettlement of Europeans, on this fpot,) it is not probable that more than 1000 children were *born* here; and, even admitting that *all* of thefe died here, the proportion of *fuch* could not, agreeably to Dr. Halley's eftimate, exceed thirty-four, during the year 1789. But it is probable, that many of thofe who were born here, during the above mentioned term of twenty-one years, had removed from the city, prior to the year 1789; and it is alfo probable, that *fome* of thofe who died at Philadelphia in that year, aged upwards of eighty, were not natives of this city—It may, therefore, be prefumed, that the *chances* of an addition to the number of thofe dying after eighty, which have been loft by the removal of natives before that age, may be *balanced* by
the

the fame number of non-natives, who died here after eigh-
ty, in the courfe of that year. In this cafe, the number
of thofe who die at Philadelphia, after completing the
80th year of their age, compared with the total number of
deaths in the year 1789, will ftand in the proportion of
24$\frac{1}{2}$ of the former, to 1000 of the latter. It muft be ob-
vious, to any perfon confidering this fubject, that every
calculation of the probabilities of the duration of life, at the
later periods of life, and of the proportions, which the
numbers of thofe dying at very advanced periods of its exif-
tence, bear to the numbers of fuch as die, at its early and
middle ages,—muft neceffarily give a more unfatisfactory
refult, than fimilar eftimates for the anterior periods of
life —This is the cafe, in fome degree, when applied to
any country; under whatever circumftances the applicati-
on may be made: the obfervation is true, in a greater de-
gree, when applied to towns, whether great or fmall:—
and it is ftill more juft, with refpect to *American* towns;
by reafon of the infant ftate of our country,—the continu-
al fluctuation in the migrations of the inhabitants,—and
the rapid increafe of population, as well in our capitals as
in the country generally.—The reafon of my not having
gone higher than the age of 101 years complete, is, that
M. Buffon, in his general table of the probabilities, &c.
makes no calculation for any age beyond that period of
life: out of 23,994 deaths, he eftimates only two to be liv-
ing after the completion of the 101ft year, and *none* at 102.

A further *datum* for afcertaining the fuperiority of this
country, in the progrefs of its population, is founded on
the proportion which the annual deaths bear to the whole
number of the living, in different countries.—In Dr. Price's
effay on the expectation of lives, ftate of London, popu-
lation, &c. it is laid down, as the refult of various cal-
culations, that in London and Edinburgh, there die an-
nually about one in twenty-one; in Dublin, one in twen-
<div align="right">ty</div>

ty-two; in Rome, one in twenty-three; in Amfterdam, one in twenty-four, &c. M. Sufmilch makes the proportion of thofe who die, annually, in *great* towns, to be from $\frac{1}{24}$ to $\frac{1}{28}$; in *moderate* towns, from $\frac{1}{28}$ to $\frac{1}{31}$; and, in the *country*, from $\frac{1}{40}$ to $\frac{1}{50}$. But Dr. Price fuppofes the following proportions more juft, viz. Great towns, from $\frac{1}{19}$ or $\frac{1}{20}$, to $\frac{1}{23}$ or $\frac{1}{24}$; moderate towns, from $\frac{1}{23}$ to $\frac{1}{28}$; and the country, from $\frac{1}{30}$ or $\frac{1}{35}$, to $\frac{1}{50}$ or $\frac{1}{60}$: and he is of opinion, with M. Sufmilch " that, taking a whole country in grofs, including all cities and villages, mankind enjoy among them about thirty-two or thirty-three years, each, of exiftence; or,—which amounts to the fame thing,--that one out of thirty-two or thirty-three dies annually.—Sir William Petty, in his effays on political arithmetic, fays—that in the *country*, in England, one dies out of thirty-two; and, that five are born to four that die. "This laft fact, 'fays M. Buffon,' agrees pretty well with what happens in France: but if the firft fact be true, it follows, that the falubrity of the air in France is much greater than in England,—in the proportion of thirty-five to thirty-two;—for, it is certain, that, in the *country* in France, no more than one dies out of thirty-five."—M. Sufmilch makes the proportion, as deduced from 1098 country parifhes in Germany, to be one out of forty-three. He likewife gives the proportion of one to forty-five for a country parifh in Brandenburgh: and M. Muret eftablifhes the fame, for the Pais de Vaud,--(See Dr. Price's obfervations, &c.) The two laft are the higheft proportions I find for any part of Europe. In Madeira,——(an African Ifland) Dr. Heberden ftates the proportion to be one in fifty—the climate of that Ifland, it is true, is remarkably falubrious: but Dr. Price thinks the eftimate of Dr. Heberden is exceptionable. Large towns give the proportions dying out of the whole number, much higher,—even at Breflaw— which has, in this kind of calculations, been ftiled *the*

Britifh ftandard of life,—the proportion is ftated as being one to twenty-eight.—It appears, however, by the number of inhabitants in Philadelphia and Salem, that in the former—a town about as populous as Breflaw—the proportion is one to forty-five; and in Salem, one to forty-feven.

There is no circumftance that affords a more ftriking proof of the rapid progreffion of population in this country, than the prodigious increafe in the numbers of our people, fince the original fettlements of Europeans on thefe fhores. The firft fettlement made by Europeans, within the prefent limits of the United States, was in Virginia, by a colony confifling of about one hundred Englifh, in the year 1607. The honorable Mr. Jefferfon (in his notes on Virginia) remarks, that, about the year 1654, the progreffion in the population of that ftate became pretty uniform ; importations having in a great meafure ceafed, and the inhabitants become too numerous to be fenfibly affected by Indian wars. Beginning, at that period, therefore, fays this gentleman, we find,—" that from thence to the year 1772, our tythes had increafed from 7,029, to 153,000."—The whole term being of 118 years, yields a duplication once in every 27¼ years. The intermediate enumerations, taken in 1700, 1748 and 1759, furnifh proofs of the uniformity of this progreffion."— A very inconfiderable colony of Englifh formed a fettlement at Plymouth, in New-England, in 1620. In 1643, 21,200 perfons, alfo emigrants from Britain, fettled in New-England : and, fince that period, it is fuppofed more have emigrated from thence, than the numbers who had gone thither would amount to.* In the year 1760, they were increafed half a million.——Therefore, as Dr. Price obferves, they have all along doubled their own number, in twenty-five years. Two years fince, Mr. Morfe eftimated tha number of people in New-England, at 823,000.

Our

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* See a difcourfe on Chriftian union, by Dr. Stiles—Bofton, 1761.

Our late Prefident, the illuftrious Franklin, was of opinion, that the people of thefe ftates double their number in twenty years.* Dr. Price feems to think---that, " in the back fettlements, where the inhabitants apply themfelves entirely to agriculture, and luxury is not known, they double their own numbers in fifteen years; and all through the Northern colonies, in twenty-five years ;---- which, continues Dr. Price, is an inftance of increafe fo rapid, as to have fcarcely any parallel."---Even in Madeira---where, according to Dr. Heberden, only $\frac{1}{50}$ part of all the inhabitants die annually,---it is faid they do not double their number in lefs than eighty-four years.

To affift us in forming a fatisfactory judgment, refpecting the probabilities of the duration of life, in this country---a confideration intimately connected, in the prefent enquiry, with the caufes of the quick progrefs of its population,---it becomes neceffary to examine into the ‡ longevity of the inhabitants.---Having noticed, in the preceding part of thefe obfervations, that nearly one half of the people, in the Northern and middle ftates of the union, are under fixteen years of age—although Dr. Halley ftates, that, in Europe, the proportion of fuch is only one-third----the inference, neceffarily refulting from thefe facts, is---either, that the probability of the continuance of life is greater here than in Europe, between the birth and fixteen years of age, out of equal numbers born; or, if the probabilities are equal, prior to that period of life, in the two countries refpectively—that the proportion of births to the number of inhabitants, here, exceeds that in Europe ;---or, on the other hand, that the probabilities of life are lower in this country, fubfequent to that period.

<center>F 2</center> <div align="right">From</div>

* Obfervations concerning the increafe of mankind, peopling of countries, &c.

‡ " Thofe inhabitants of Pennfylvania, who have acquired the arts of conforming to the changes of our weather, in drefs, diet, and manners, efcape moft of thofe acute difeafes, which are occafioned by the fenfible qualities of the air : and faithful enquiries and obfervations have proved, that they attain to as great ages, as the fame number of people in any part of the world."----Dr. Rufh's account of the climate of Pennfylvania, &c.

From circumſtances which have been already ſtated, it is
evident the proportion of births, to the exiſting number
of the whole people, is greater here than in Europe : but
it is not probable that this exceſs is greater than in the pro-
portion of one-half to one-third---I preſume it is rather
leſs.---If, however, this exceſs be in the ratio of three to
two, the chances of life from the birth to ſixteen will, in
this caſe, be the ſame in both countries. On this ſuppo-
ſition, then, the probabilities in favor of the continuance
of life *after* ſixteen, through all the ſubſequent ſtages of
its poſſible exiſtence, muſt be higher here than in Europe:
becauſe, as I have ſhewn, only one in forty-five die an-
nually, even in the city of Philadelphia; whereas, in
France, the proportion is one in thirty-five, and in En-
gland, one in thirty-three.

In addition to what has been ſaid, reſpecting the longe-
vity of the inhabitants of Connecticut, and of Hingham
and Ipſwich-Hamlet in Maſſachuſetts, I ſhall mention a
few remarkable inſtances of longevity, which have occurred
in other parts of the union--They are not adduced as being
of themſelves, proofs of American longevity; but rather
to evidence its reality, in ſuch caſes as ſerve to corrobo-
rate the truth of the poſition, that the people of this coun-
try are long-lived.---The inſtances are the following.---In
the year 1765, a Mr. Temple died in the county of Wor-
ceſter, Maſſachuſetts, aged eighty-ſix years--He left eight
children, four ſons and four daughters, all of whom were
living in September 1788; and their ages were as follow,
viz. 89, 85, 83, 81, 79, 77, 75, and 73. John Sydenham
(commonly called Sidman) was living near Mount Holly,
in the ſtate of New-Jerſey, on the 5th of November 1788:
he was then 106 years and three months old—This man
was born near Exeter, in England; but was brought to
America, when only eighteen months of age.—Edward
Drinker was born in Philadelphia, December 24th, 1680,

<div align="right">and</div>

and died November 17th, 1782.—Mr. Hooton, a native
of the city of New-York, was living laft fummer (and I
believe is ftill alive,) in the diftrict of Southwark; aged, at
that time, upwards of 107 years.—In the bill of mortali-
ty for Chrift church and St. Peter's, in this city, in the
year 1775, I obferve the death of one perfon, aged 120
years.   The Pennfylvania Mercury of the 1ft of March,
1788, has, republifhed from a Wilmington paper under
the date of February 27th, the names of fifty perfons
then living, in Anameffex and Pocomoke Hundreds, So-
merfet county, in the ftate of Maryland,--all of great ages:
of thefe, twenty-three were upwards of ninety years of
age; fixteen, upwards of eighty-feven; and eleven, aged
eighty-five.——In the year 1775, Mrs. Lear died at Portf-
mouth, New-Hampfhire, at the age of 103 years.   In the
fame year, Mrs. Abigail Mayo died at Cambridge, Maffa-
chuffetts, aged 106 years.   And Mr. William Ward, a
native of Fairfield, in Connecticut, died in the ftate of
New-York, alfo in the year 1775, aged 105 years, four
months and twenty days.
    On the 20th of Sept. 1788, died at his feat in Albemarle
country, Virg. Daniel Maupin, who was born on the 25th
of March, 1700. At the time of his death, there were li-
ving, of his offspring, upwards of 200 perfons, including
fome of the fifth generation. His wife was then alive and
in good health; and it was not known that any female of
her generation, after attaining to the years of a woman,
died under the age of eighty-five years.---About three
years fince, Arthur Bibbington died at Wyndham in Con-
necticut, aged 107 years:---And, about the fame time
Mrs. Jane Brafher died in the city of New-York, at the
age of a 102 years.---Timothy Matlack, Efq. clerk of the
Senate of Pennfylvania, has favored me with a communi-
cation of the following facts, tranfcribed from a note made
by him, about twenty-four years fince—Upon reading a
                                                        paragraph

paragraph in a Philadelphia paper, republifhed from an *Englifh* paper, mentioning that five brothers, the fons of one mother, had met, whofe ages, added together, amounted to 311 years,—his mother (a widow) obferved, that fhe had five brothers and fifters, then living—the children of one man and one woman, whofe ages, added to her own amounted to upwards of 400 years—He alfo mentions, that there were then living, of the brothers and fifters of his father, fix perfons—the children of one man and one woman,—whofe ages added together amounted to 426 years; all of whom were born in weft New-Jerfey---At the fame time, his wife obferved, that her father had fix brothers and fifters---the children of one man and one woman,---all born in Pennfylvania and then living,---whofe ages added together, including his own, amounts to 470. To thefe circumftances, his mother added, that fhe and her two fifters had borne thirty-feven children; of whom thirty were then living,---and the youngeft of them, feventeen years old. Hence it appears, that the mean age of thefe *nineteen perfons*---who may be confidered as of *one family*---exceeded fixty-eight years. Mr. Matlack adds, that he is not certain whether any of his father's brothers be now living; although fome of them were alive, within a few years paft: But, that the laft of his mother's fifters died four years fince, and the laft of his wife's uncles died within a few months paft.*

But

Additional Inflances of Longevity, in America.

* On the 4th of February, 1787, died in Pennfylvania, in the 103d year of his age, Jacob Wifmer, a native of Germany. In Queen Anne's reign, he emigrated to N. Carolina, where he lived ten years; after which he fettled in Bucks county in Pennfylvania, where he married his third wife, with whom he had 170 children, grand-children and great grand-children; and left his widow, about 84 years old.—He muft have refided in America, *at leaft* 72 years.
  Zachariah, regent of the Mohegan tribe of Indians, died in his Wigwam, in Pomfchang near Norwich, in Connecticut, in the 100 year of his age—in the year 1787.
  Mrs. Hannah Flagg, died at Bofton, at the age of 102 years—in the year 1787.
  Dr. Bernard Vanlear died in Delaware county, Pennfylvania, in the 104th year of his age—in the year 1790.
  At Exeter in New-Hampfhire, in 1790, Mr. Thomas Hayley,—aged 101 years.
  At Southborough in Maffachufetts, in 1790, Mrs. Newton,—aged 106 years—Her mother lived 113 years, and her fifter 102 years.   At

But numerous and remarkable inftances of American longevity are, by no means, confined to the Northern and middle ftates. On the authority of two gentlemen of re-fpectability and obfervation one from Virginia—and the ‡ other from North-Carolina,---I am warranted in faying, fuch inftances occur in thofe ftates, as induce a belief, that their climates are favorable to a long duration of human

man

At Thomfon in Connecticut, in 1790, Mr. Henry Elthorp—aged 105 years.
At Albany, in the ftate of New-York, in 1790, Mr. Abraham Vanverts,—aged 124 years.
At Eaft-Haddon, in Maffachufetts, in 1790, Mr. Weeks Williams,—aged 100 years.
At Windham in Connecticut, in 1788, Mr. Arthur Ribbins—aged 110 years and ten months.
At Chefterfield in Virginia, in 1788, Daniel Nunally—aged 105 years.
At Wilmingten in the ftate of Delaware, in 1789, Mr. Chriftopher Hendrickfon,—aged upwards of 100 years---He was one of the firft Swedifh fettlers on the Delaware.
At Northampton in Maffachufetts, in 1788, Mr. Jofiah Clark--aged 92 years. He was the youngeft of 11 children (fix fons and five daughters,) three of whom lived to be above 90, four above 80, and three above 70 years of age. From the fix fons, only, have defcended 1158 children, grand-children and great-grand children; 925 whom are now living.
At Dover in New-Hampfhire, Mrs. Margant Wight, in 1787---aged 102 years.
In Berks county, Pennfylvania, in 1789, Jofeph Mountz,---aged 100 years.
At New-London, Connecticut, in 1789, Mrs. Dowfett,---aged 102 years.
In the city of New-York, in 1789, Mrs. Elizabeth Lynch,---aged 104 years.
At Great Barrington, in Maffachufetts, in 1789, Mrs. Chapman,---aged 102 years.
In South-Carolina, not long fince, Mrs. Dedcot,---aged upwards of 100 years; Mrs. Maffey, aged 102; and Mrs. Maffey's nurfe, aged 115 years.
I am indebted to Jonathan Williams, jun. Efq. one of the Secretaries of the A. P. S. for the following inftances of American Longevity, which he was fo obliging as to tranfmit to me, from Richmond in Virginia, in June laft ——viz.
Abraham Eades, now living in Albemarle county Virginia, is 110 years old.----His wife died at 100, and they were married 80 years.
A man of the name of Ice, Monongalia county Virginia, is now living---106 years old.
A Mr. Crafton, King and Queen county Virginia, is 104 years old, now living.
John Dance, of Chefterfield county Virginia died at 125 years old. He began to cut teeth before his death.

‡ *Dr. Williamfon. This Gentleman has given me permiffion to make ufe of the following letter, on this occafion.*

SIR,
It is not poffible to give a general rule which fhall apply to the feveral parts of North-Caro-lina, in anfwer to your queftions concerning the duration of human life in that ftate. In the eaft-ern part of the ftate, within fifty or fixty miles of the fea, where the country is flat and there are many marfhes, the inhabitants are much afflicted during the fummer and autumn by inter-mitting and other bilious fevers. During the winter, as the cold is feldom intenfe and by no means conftant or certain, the inhabitants in general are not fufficiently careful to defend themfelves againft the cold: hence many, in the vigor of life, men efpecially, are cut off in a few days by pleuritic or other inflammatory fevers. Such is the ftate of the fluids in thofe who have been reduced by intermittents during the autumn, that they feldom refift inflammatory fevers. Time and obfervation will doubtlefs teach the inhabitants, by keeping themfelves dry and warm, to prevent what they cannot readily cure. There are inftances neverthelefs of a con-fiderable degree of old age, in that very climate. In the weftern parts of North-Carolina, to-wards the mountain, the inhabitants enjoy a great degree of health. Many of them have ve-ry numerous families and attain to old age. As that country was long the refidence of a ma-ternal anceftor, I have probably been more attentive to the progrefs of population there.
We

man life. The fame may be obferved, with refpect to †
South-Carolina and Georgia, in which ftates the climate
is falubrious; although low, flat parts of the country,
and fuch as lie in the vicinity of the rice and indigo fwamps,
as well as the bad quality of the water in fuch fituations,
render fome parts of thofe countries unhealthy.—Even in
Eaft-Florida (if Captain Bernard Romans is to be credit-
ed), the climate is very healthful—St. Auguftine, the
capital

We have fome reafon for believing, that on the weft fide of the Apellachian mountain, in the
territory ceded by North-Carolina, the period of human life may be extended to what would
be called a great length in any part of the world.

In that country, there are few marfhes or ponds of ftagnant water. The foil is dry, and lime
ftone abounds every where : the water is confequently very good.

In or near the latitude of 36 degrees, we are neither to expect the extremes of heat nor cold ;
but we have noted caufes in this very latitude, which are very injurious to health : thefe caufes
however do not exift in the country of which I am fpeaking. The Apellachian mountain effectu-
ally protects the inhabitants from the moift and cold eafterly winds with which we are afflicted
in the Atlantic ftates; and the North-Weft wind, in fuch a latitude, at fuch a diftance from the
ocean and on the weft fide of thofe great mountains, has little of that piercing quality by which
it is diftinguifhed in this part of the world. From the circumftances mentioned you would in-
fer, and experience fupports the inference, that the inhabitants of that country are neither af-
flicted with intermitting fevers, inflammatory fevers, confumptions, nor other difeafes, which
are ufually induced by heat and moifture or by a fudden check to the perfpiration. As no part
of that country has been fettled much more than twenty years, we are not to expect many in-
ftances of extreme old age, among the inhabitants; but appearances are in favour of long life.
In the year 1789, Jonathan Tipton died, in Wafhington County near Halfton River, aged 105
years : he had lived there 20 years. Benjamin Cobb, Val. Sevier, and others, have been mention-
ed to me, as perfons now living in that country, above 90 years old, who enjoy perfect health;
and ride about, as ufual, in purfuit of bufinefs or amufement.

I am Sir,

With the utmoft refpect

Your obedient Servant,

Philadelphia, 17th March, 1791.   HU. WILLIAMSON,

† The author of a work , entitled—" An hiftorical account of the rife and progrefs of the
Colonies of South-Carolina and Georgia" (printed in London, in 1779,) obferves,
that in South-Carolina, in the months of July, Auguft and September, the heat in the fhaded
air, from noon to three o'clock, is often between 90° and 100°: but, that fuch extreme heat is of
fhort duration. He fays, he has feen the mercury, in Fahrenheit's Theremometer, rife in the
fhade to 96° in the hotteft, and fall to 16° in the cooleft feafon of the year; and that others have
obferved it as high as 100° and as low as 10°—He obferves that the mean diurnal heat of the dif-
ferent feafons, in South-Carolina, has been, upon the moft careful obfervation, fixed at 64° in
fpring, 79° in fummer, 72° in autumn, and 52° in winter; and the mean nocturnal heat, in
thofe feafons, at 56° in fpring, 75° in fummer, 68° in autumn, and 46° in winter; The mean
temperature of the air is, therefore, in South-Carolina, (at leaft, in the level and maritime
parts of the ftate) 64°, which is 11°¾ lefs than what Dr. Rufh mentions to be the ftandard tem-
perature of the air, in the city of Philadelphia, viz. 52°¼—" It has been obferved (fays the
author of the hiftory of Carolina, &c.) that, in proportion as the lands have been cleared and
improved, and fcope given for a more free circulation of air, the climate has likewife become
more

capital of that province, is, in his opinion, as healthy a spot as any on the continent. He afferts, that the Spanifh inhabitants lived here to a great age; and that the people of the Havanna confidered it as their Montpelier, frequenting it for the fake of health.---According to Captain Romans, the climate of Weft-Florida agrees, in every refpect, with that in the Northern divifion of Eaft-Florida; excepting that the winters are fomewhat more fevere, in the former---He fays there were fuch inftances of longevity in Weft-Florida, as were not to be outdone in any part of America. Yet circumftances, fimilar to thofe which render particular *fituations*, in fome of our Southern ftates, unfavorable to health,---produce fimilar effects in fome parts of thefe two provinces; though in a greater degree. Clavigero (in his hiftory of Mexico) afferts that Calmecahua, one of the Tlafcalan captains who affifted

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more falubrious and pleafant. This change was more remarkable in the heart of the country, than in the *maritime* parts, where the beft plantations of rice are, and *where water is carefully preferved to overflow the fields*: yet even in *thofe* places, cultivation has been attended with falutary effects---time and experience had now taught the planters, that, during the autumnal months, their living among the low rice plantations fubjected them to many diforders, from which the inhabitants of the *capital* were *entirely exempt:*——This induced the richer part to retreat to *Town*, during this unhealthy feafon. Governor Ellis has mentioned that, on the 7th of July, while he was writing in his piazza, in Savanna, the Mercury ftood at 102° in the fhade; that it had twice rifen to that height, during the fummer, feveral times to 100° and, for many days together, to 98°; and in the night, it did not fink below 89°. He had the fame thermometer with him, in the equatorial parts of Africa, in Jamaica, and in the Leward iflands: yet it appears, that he never found it fo high in thofe places;---its general ftation was between 79° and 86°. He acknowledges, however, that he felt thofe degrees of heat, in a *moift* air, *more difagreeable than at Savanna*, when the themometer ftood at 84° in his cellar, at 102° in the ftory above it, and in the upper ftory of his houfe, at 105°.—And he afferts, that few people died at Savanna, out of the ordinary courfe; though many were working in the open air, expofed to the fun during this extreme heat, (See notes to the tables, N°. 11.) The town of Savanna being fituated on a fandy eminence, greatly increafes the heat of that fpot: But the climate of Georgia, in general, like that of South-Carolina, is more mild and temperate in the inland, than in the maritime parts. And the late Dr. Moultrie,—who refided, and practifed phyfic with great reputation, in South-Carolina, fifty years—was of opinion, that Charlefton is as healthy a fpot, as any upon earth.—A writer, in a late Charlefton paper—who fubfcribes the fignature H. L. and dates from St. Johns, Berkeley, (fuppofed to be Henry Laurens, Efq.) fays he has frequently heard Dr. Moultrie declare that opinion: and this writer gives the names of fifteen perfons, who had died in South-Carolina, within a fhort time paft, whofe ages average 83¼ each:—three of the fifteen averaged 105⅔ years, each. He mentions, alfo, that a great number of other inftances might be adduced, of perfons who within his own memory, lived to the like great ages;—feveral, upwards of 100 years.

On the whole, it is evident—that, in South-Carolina and Georgia, the flat, marfhy parts of the country, and the artificial fwamps which the culture of Rice and Indigo render neceffary,—are, only, unhealthful: but that high, airy and dry fituations, in thofe ftates, experience no fuch effect, from the *heat* of the climate.

the Spaniards, in the conqueft of Mexico, lived 13c years.
He alfo makes mention of a Jefuit, who died in that coun-
try at the age of 132 ; and of a Francifcan, who died in
Sombrerete, aged 117, making preachings to the people,
until the laft month of his life. " We could (fays this
author) make a long catalogue of thofe, who, in the two
centuries paft, have exceeded one hundred years of life;
in thefe countries :---*particularly among the Indians*, there
are not a few, who reach 90 and 100 years ; preferving,
to old age, their hair black, their teeth firm, and their
countenance frefh."—Don Ulloa (in his Noticias Ameri-
canas) fays, that, in general, the American Indians live
to a great age.---This longevity, attended in general with
uninterrupted health, is thought, by fome writers, to be the
confequence in part of their vacancy from ferious thought
and employment, joined alfo with the robuft texture and
conformation of their bodily organs. If, continues this
writer, the Indians did not deftroy one another, in their
almoft perpetual wars-- and if their habits of intoxication
were not fo univerfal and incurable, they would be, of all
the races of men who inhabit the globe, the moft likely
to extend, not only the bounds, but the enjoyments of ani-
mal life, to their utmoft duration.

In the courfe of thefe obfervations, I have endeavoured
to fhew---and, I flatter myfelf, not altogether without fuc-
cefs,---that the probabilities of life, *in all its ftages*, from
its commencement to the utmoft poffible verge of its du-
ration, are higher in thefe United States, than in fuch Eu-
ropean countries, as are efteemed the moft favorable to life.
And, if this pofition be well founded, it follows---that the
bodily conftitutions of the American people are proporti-
onably *healthful.* For, although it may be deemed pro-
blematical by fome, whether an extraordinary degree of
vigor, in the fyftem of the human body, affords a greater
probability of attaining to extreme old age, than, *cæteris*
paribus

paribus, is annexed to a more delicate frame;---yet it will not admit of a doubt, that a great portion of vital energy and ftrength muft neceffarily exift, where the probabilities of life are high throughout all its periods---from the birth, until the ufual term of its duration be compleated.

The climate of much the greater portion of the United States furnifhes great degrees of* heat and cold, in their refpective feafons; but neither of the extremes is of long continuance. Our climate is alfo very † variable, the temperature of the atmofphere being liable to great and fudden viciffitudes. Neverthelefs, taking the whole rontine of the feafons, we enjoy a large proportion of fine and moderate weather; with more days of‡ fun-fhine and ferene fky, than, perhaps, any part of Europe exhibits. A very confiderable part of * France experiences greater

<div align="center">G 2</div>

<div align="right">extremes</div>

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* Dr. Rufh has noticed—in his account of the climate of Pennfylvania---that "the greateft degree of heat upon record, in *Philadelphia*, is 95°:" but the obfervations made at Spring-mill (13 miles from Philadelphia, in lat. 40°. 9′,) fhew---that.the Mercury rofe to 96°, at *that place*, on the 3d of July, 1787; yet the mean degree of heat, during that day, was only 85°8-10.----See Columbian Mag. for Auguft 1787.

† Dr. Rufh---in his account of the climate of Pennfylvania---has cited the authority of Dr. Huxam, to fhew---that the healthieft feafons in Great-Britain have often been accompanied by the moft variable weather. And Dr. T. Bond---in his oration before the Philofophical fociety, in 1782---remarks, that "we live in a healthy, though the moft variable and active climate, in the univerfe"---" Hiftory (he obferves, further) and the firft fettlers of this country agree, that the native Indians of North-America were found, by the Europeans, to be a ftout, hardy, brave, virtuous, healthy, and remarkably long-lived people." After other obfervations on this fubject, the Doctor continues thus---" I am fenfible this opinion, of the advantages re-fulting from a changeable atmofphere, is counter to the common notions of mankind :---it is neverthelefs true, and adopted by the beft writers ;---and not only confirmed by meteorological and morbid regifters, and the general laws of creation ; but will further ftand the teft of hif-torical enquiry."

‡ "The month of May, 1786, will long be remembered, for having furnifhed a very un-common inftance of the abfence of the fun for fourteen days, and of conftant damp or rainy weather."---Dr. Rufh's account of, &c.

* Mr. Jefferfon (in his notes on Virginia) makes mention, that, "at Williamfburg, in Auguft 1766, the mercury in Fahrenheit's thermometer was at 98° correfponding with 29¼ of Reaumur---At the fame place, in January 1780, it was at 6° correfponding with 11¼ be-low o, of Reaumur At Paris, in 1753, the mercury in Reaumur's thermometer was at 30¼ above o; and, in 1776, it was at 16 below o:---the extremities of heat and cold, therefore, at Paris, are greater than at Williamfburg, which is the hotteft part of Virginia."---Captain Romans fays---that, in Eaft-Florida, on fome fultry-hot days in July and Auguft, he has known the mercury rife to 94° of Fahrenheit's fcale : but that, during the fummer, the gene-ral height of the mercury was between 84°, and 88°, when the thermometer was placed in the fhade, acceffible to a free circulation of the air.--At the Norriton obfervatory (in lat. 40°. 9′. 31″, and about twenty miles Weftward from Philadelphia,) the mercury in Fahrenheit's thermometer---not expofed to the fun fhine, but open to the air---was at 94½, on the 5th of July, 1769; which was the greateft height it had ever been obferved to rife to, at that place.

<div align="right">(from</div>

extremes of heat and cold, than the United States in gene-
ral : yet we find that country to be more favorable to fe-
cundity and life, than England, where the fummers
and winters are † lefs intemperate. And in the Swifs Can-
tons and Sweden, where the frequent and fudden changes,
in the temperature of the atmofphere, are very fimilar to
the viciffitudes which prevail in our own climate,—the na-
tives are a hardy, vigorous and healthful people. Accord-
ing to M.Catteau, in his general view of Sweden, the win-
ters in that country are long, dry and extremely cold ;
the fummers fhort, and exceedingly hot ; and the inha-
bitants experience a rapid change from the former of thefe
feafons to the latter, fpring and autumn being almoft un-
known to them. The pure and fharp air which the Swedes
breathe (this writer further obferves,) renders them vigo-
rous, and preferves them from epidemical difeafes : and
he refers to a memoir publifhed by M. Wargentin, to
fhew, that there are numerous inftances of their attaining
to a very great age.   The

(From a letter dated July 26, 1769, from Mr. Rittenhoufe, to the late Rev. Mr. Barton-*penes
W. Barton.)—Dr. Rufh, in his account of the climate of Pennfylvania, obferves—that the
mercury in Fahrenheit's thermometer ftood at 95°. on the 15th of Auguft 1779, at Philadel-
phia, (which is the higheft degree to which it has ever been known to rife in this city;) and
that it fluctuated between 93°. and 80°. for many weeks. The Doctor fays it ftood, for feve-
ral hours, at 5°. below o, in January 1780, at Philadelphia ; and, during the whole of that
month, excepting one day, it never rofe to the freezing point, in the city.---It appears by
Mr. Wigglefworth's thermometrical obfervations --(publifhed in the memoirs of the Bofton
Academy, for the year 1783,) that, at Cambridge in Maffachuffetts, in Auguft, 1780, the
mercury was at 92°. of Fahrenheit's fcale.
    † I have faid " *lefs intemperate*"---The climate of England is, by no means, a temperate
one. That country not only experiences great extremes of heat and cold ; but the weather is
remarkably variable and inconftant, with very frequent rains: The tranfitions from heat to
cold, and from moifture to drynefs---and *vice verfâ*---are fudden, and confiderable in their
degree.   On the 18th of June 1788, the mercury, by Fahrenheit's fcale, was at 88°. in Lon-
don ; and, on the 30th and 31ft days of December, in the fame year, it fell to 4½ at the city
of Canterbury---On the 5th of January following, the mercury was at 5¼ at the latter place.
The weather was very fevere, in England, from the 21ft of December 1788, to the 11th of
January 1789; during which term, the mercury rofe twice to 44°. and once to 45°.   Even at
Sienna in Italy---in lat. 43°. 10′---during the fame interval of time, the mercury fell, on the
31ft of December 1788, to 10°; and, on the 11th of January following, it rofe to 53°.----
The obfervations at Canterbury and Vienna, were taken from two Sixian thermometers.
(See Gent. Mag. for February and May, 1789.)---I alfo find, that, on the 21ft and 22d days
of laft June, the mercury was at 86°. in London, by Fahrenheit's thermometer : and an En-
glifh gentleman affures me, he has known a froft happen, in England, in the laft week in Ju-
ly---Dr. Rufh, in his account of the climate of Pennfylvania, mentions Mr. Rittenhoufe's hav-
ing informed him, that he had never paffed a fummer, during his refidence in the country,
without difcovering froft in every month of the year, *excepting July*.

The winters, in our own country, ‡ brace and invigo-
rate the bodies of the people : and the genial warmth of
our fummers increafes the * generative principle of animal
nature :—the cold is accompanied with a pure and † elaftic
atmofphere ; and, during the continuance of the greateft
heats, the air is frequently ‡ corrected by thunder-gufts
and plentiful fhowers of refrefhing rain.—The face of the
country, too, is of fuch a nature, as muft contribute to the
falubrity of the climate—The United States are, in gene-
ral, diverfified with hills and vallies, mountains and
plains : and Ariftotle obferves, that people do not feel
the effects of age fo foon, in hilly, as in flat countries.

What has been premifed, concerning the longevity of
the inhabitants of thefe ftates, will, I prefume, be an am-
ple refutation of thofe writers, who, influenced by Euro-
pean prejudices, or confidering the fubject in a fuperficial
manner, have afferted, that the Americans are not fo long-
lived as the Europeans.

On the whole I truft, that the points, which it was my
principal defign to afcertain, have been fatisfactorily efta-
blifhed. With a view, however, to a further illuftration of
this interefting fubject, I have formed the tables (which
are annexed hereto,) fhewing the numbers dying annually

out

‡ Zimmerman, treating of the effects of a cold climate, fays---" Frigoris igitur perennitas,
et artus, et integra corpora, comprimendo corroborat, efficitque ut naturam longé firmiorem,
valentioremque induant."---Zool. Geograph.

* From a table of the baptifms, marriages and deaths, at Paris, frcm 1745 to 1766 (both
inclufive,) the Count de Buffon has fhewn,---that the months in which the greateft number of
children were born, are March, January and February; and that thofe in which the feweft
were born, are June, December and November : from which circumftance, he infers---that,
in the climate of France, the heat of Summer contributes to the fuccefs of generation.---(Sup-
plement to his nat hift.)

† " The air in Pennfylvania, when dry, has a peculiar elafticity, which renders the heat
and cold lefs infupportable than the fame degrees of both are, in moifter climates. It is only
in thofe cafes when fummer-fhowers are not fucceeded by North-Weft winds, that the heat of
the air becomes oppreffive and diftreffing, from being combined with moifture." Dr. Rufh's
account of, &c.

‡ " The heat of Summer feldom continues more than two or three days, without being fuc-
ceeded by fhowers of rain, accompanied fometimes with thunder and lightning, and afterwards
with a North-Weft wind,--·which produces a coolnefs in the air that is highly invigorating and
agreeable"———" There are feldom more than three or four nights, in a fummer, in which
the heat of the air is nearly the fame as in the preceding day. After the warmeft days, the
evenings are generally agreeable, and often delightful."---Dr. Rufh's account of the climate
of Pennfylvania.

out of 1000 perfons, in the city of Philadelphia, and the
town of Salem in Maffachufetts, at eleven different peri-
ods of life.   The table for Philadelphia, (No. 1.) is con-
ftructed from the bills of mortality for the congregations
of Chrift-church and St. Peter's in this city, for† twenty-
two years; viz. from Chriftmas 1754, to Chriftmas 1790,
exclufive of fourteen years during that term.   And the
table (No. 2.) is formed from the bills for the fame con-
gregations, for the years 1782, 1788, 1789 and 1790:
from which it will appear, that, although one-eighth of
the whole number, in the bill for 1782, are ftated to have
died of the fmall-pox, the mortality has been lefs, taking
the medium of thefe four late years, that the medium of
eighteen preceding years gives it.—The table for Salem,
in Maffachuffetts, is formed from the bills of mortality,
for that town, for the years 1782, 1783, 1788 and 1790:
But I have before obferved, that the years 1782 and 1783
were unufually fickly; and this circumftance has, no doubt,
exhibited the probabilities of life too low, for that town;
efpecially, as I find the bill for 1788 makes the probabilities
confiderably higher, than the average of thofe four years.
I have alfo given a general table of the probabilities of life,
at the fame periods of its duration,—formed from the efti-
mates of the Count de Buffon;—one for the city of Paris,
alfo from the eftimates of that celebrated author;---and,
likewife, tables for fundry other cities and places; which
I have taken from thofe fubjoined to Dr. Price's effay on
the expectations of lives, and adapted to the fame fcale and
the fame periods of life, as the others.—Belides thefe, I
have ftated the proportions dying, annually, out of the
whole number of the living, in a variety of places;—and
the

† I was favored with thefe bills by Michael Hillegas, Efq.---The earlieft is from Chriftmas
1754 to Chriftmas 1755; and the lateft is for the laft year, ending at Chriftmas.   Mr. Hil-
legas furnifhed me with two others, viz. for the years 1756 and 1759; making, in the whole,
twenty-four years : but, as there appears to have been a *very extraordinary* degree of mortality,
among children under three years of age, during thofe years,---I left them out of my calcula-
tions.   The bills for twelve other years, between 1755 and 1790, could not be obtained.

the proportions of thofe who die, after compleating the 80th year of their age, out of 1000 annual deaths,---for various cities, towns and countries.---A comparifon of the refults of thefe feveral tables, furnifhes very interefting conclufions, in regard to the fubject of the foregoing obfervations.

Although, in treating this fubject, I have protracted my obfervations to a greater length than I had defigned,— I cannot conclude without remarking, that the refult of this inveftigation has afforded me great pleafure. —Muft not the mind of every American citizen be impreffed with gratitude, and glow with emotions of a virtuous pride, when he reflects on the bleffings his country enjoys? Let him contemplate the prefent condition of the United States,—enjoying every advantage which nature can beftow—inhabited by more than three millions of the freeeft people on earth—and poffeffing an extent of territory amply fufficient to maintain, for ages to come, many additional millions of freemen, which the progreffion of its population is fupplying, with wonderful celerity;—let him, alfo, contraft this fituation of his country, with the condition in which it was found by our anceftors, fcarcely two centuries ago;—and it will be impoffible for him not to experience, in an exalted degree, thofe fenfations, which patriotifm and benevolence ever infpire!——

I am, Dear Sir,

With great Refpect,

Your affectionate Nephew,

W. BARTON.

Philadelphia, March
17th, 1791.

TABLES

'TABLES, shewing the Probabilities of the Duration of Human Life, from the Birth up to ninety years of age---for divers intermediate Periods of Life;---at the City of Philadelphia, and at the Town of Salem in Massachusetts; and also in several parts of Europe.————

GENERAL Table of the Probabilities of Life, from the Calculations of *M. Buffon*.			N°. 1. PHILADELPHIA, for twenty-two Years.		
Periods of Life.	Persons living.	Decrease of Life.	Periods of Life.	Persons living.	Decrease of Life.
	1,000			1,000	
Between the Birth and 3	591	409	Between the Birth and 3	612	388
3 and 5	540	51	3 and 5	555	57
5 and 10	490	50	5 and 10	511	44
10 and 20	450	40	10 and 20	465	46
20 and 30	392	58	20 and 30	368	97
30 and 40	323	69	30 and 40	270	98
40 and 50	252	71	40 and 50	178	92
50 and 60	180	72	50 and 60	114	64
60 and 70	101	79	60 and 70	52	62
70 and 80	27.63	73.37	70 and 80	20	32
80 and 90	3.54	24.09	80 and 90	5.61	14.39

N°. 2. (a) PHILADELPHIA, for 1782, 1788, 1789 and 1790.			SALEM (in *Massachusetts*) for 1782, (b) 1783, 1789 and 1790.		
Periods of Life.	Persons living.	Decrease of Life.	Periods of Life.	Persons living.	Decrease of Life.
	1,000			1,000	
Between the Birth and 3	611	389	Between the Birth and 3	----	----
3 and 5	569	42	3 and 5	555	445
5 and 10	546	23	5 and 10	505	50
10 and 20	497	49	10 and 20	470	35
20 and 30	400	97	20 and 30	342	128
30 and 40	296	104	30 and 40	252	90
40 and 50	195	101	40 and 50	169	83
50 and 60	140	55	50 and 60	129	40
60 and 70	62	78	60 and 70	94	35
70 and 80	25	37	70 and 80	26	68
80 and 90	6	19	80 and 90	(c)	

SALEM (in *Massachusetts*,) for 1790. (d)			PARIS, From the Calculations of M. Buffon. (e)		
Periods of Life.	Persons living.	Decrease of Life.	Periods of Life.	Persons living.	Decrease of Life.
	1,000			1,000	
Between the Birth and 3	----	----	Between the Birth and 3	----	----
3 and 5	550	450	3 and 5	580	420
5 and 10	503	47	5 and 10	524	56
10 and 20	487	16	10 and 20	485	39
20 and 30	356	131	20 and 30	433	52
30 and 40	293	63	30 and 40	366	67
40 and 50	220	73	40 and 50	293	73
50 and 60	178	42	50 and 60	212	81
60 and 70	126	52	60 and 70	116	96
70 and 80	42	84	70 and 80	32	84
80 and 90	15.71	26.29	80 and 90	4.50	27.50

LONDON; from the calculations of M. Büffon, *(e)*			LONDON; from the calculations of Dr. Price.		
Periods of Life.	Perfons living.	Decreafe of Life.	Periods of Life.	Perfons living.	Decreafe of Life.
	1,000			1,000	
Between the Birth and 3	---	-----	Between the Birth and 3	492	508
3 and 5	587	413	3 and 5	426	66
5 and 10	553	34	5 and 10	374	52
10 and 20	522	31	10 and 20	325	49
20 and 30	436	86	20 and 30	272	53
30 and 40	332	104	30 and 40	219	53
40 and 50	222	110	40 and 50	148	71
50 and 60	138	84	50 and 60	97	51
60 and 70	72	66	60 and 70	50	47
70 and 80	25	47	70 and 80	16	34
80 and 90	3.20	21.80	80 and 90	2	14

VIENNA.			BRESLAW in SILESIA, from the Calculations of Dr. Halley.		
Periods of Life.	Perfons living.	Decreafe of Life.	Periods of Life.	Perfons living.	Decreafe of Life.
	1,000			1,000	
Between the Birth and 3	431	569	Between the Birth and 3	760	240
3 and 5	379	52	3 and 5	710	50
5 and 10	327	52	5 and 10	653	57
10 and 20	288	39	10 and 20	592	61
20 and 30	247	41	20 and 30	523	69
30 and 40	199	48	30 and 40	436	87
40 and 50	147	52	40 and 50	335	101
50 and 60	96	51	50 and 60	232	103
60 and 70	47	49	60 and 70	131	101
70 and 80	15	32	70 and 80	34	97
80 and 90	2	13	80 and 90	1	33

NORWICH, G. BRITAIN.			NORTHAMPTON, G. BRITAIN.		
Periods of Life.	Perfons living.	Decreafe of Life.	Periods of Life.	Perfons living.	Decreafe of Life.
	1,000			1,000	
Between the Birth and 3	544	456	Between the Birth and 3	585	415
3 and 5	498	46	3 and 5	544	41
5 and 10	440	58	5 and 10	496	48
10 and 20	394	46	10 and 20	448	48
20 and 30	341	53	20 and 30	379	69
30 and 40	290	51	30 and 40	318	61
40 and 50	233	57	40 and 50	247	71
50 and 60	168	65	50 and 60	177	70
60 and 70	94	74	60 and 70	107	70
70 and 80	31	63	70 and 80	40	67
80 and 90	4.22	26 78	80 and 90	3.48	36.52

PARISH of Holy-Crofs, Great-Britain.			PAIS DE VAUD, in Switzerland.			A Country parifh in the Electorate of BRANDENBURGH.		
Periods of Life.	Perfons living.	Decreafe of Life	Periods of Life.	Perfons living.	Decreafe of Life.	Periods of Life.	Perfons living.	Decreafe of Life.
	1,000			1,000			1,000	
Between the Birth and 3	717	283	Between the Birth and 3	735	265	Between the Birth and 3	687	313
3 and 5	659	58	3 and 5	701	34	3 and 5	642	45
5 and 10	589	70	5 and 10	653	48	5 and 10	577	65
10 and 20	545	44	10 and 20	610	43	10 and 20	527	50
20 and 30	486	59	20 and 30	563	47	20 and 30	486	41
30 and 40	426	60	30 and 40	506	57	30 and 40	432	54
40 and 50	353	73	40 and 50	431	75	40 and 50	374	58
50 and 60	273	80	50 and 60	314	117	50 and 60	282	92
60 and 70	171	102	60 and 70	168	146	60 and 70	166	116
70 and 80	90	81	70 and 80	46	122	70 and 80	44	122
80 and 90	7	83	80 and 90	5	41	80 and 90	3	41

Number of the Deaths out of 1,000, under the ages of 3 and 5 years, refpectively,--- for Ipfwich Hamlet, in Maffachufetts, Hingham, in the fame ftate, and for the city of Berlin.----

		Deaths,
IPSWICH HAMLET, on a medium of 10 years	{ under 3 years, / under 5 do.	181 ----
HINGHAM, on a medium of 54 years,	{ under 3 do. / under 5 do.	363 ----
BERLIN, from the bills given by M. Sufmilch.	{ under 3 do. / under 5 do.	516 / 598

The numbers of thofe who die, after compleating their 80th year of age---proportioned to the whole numbers of Annual Deaths;---at the following places, refpectively; viz.

Names of the Places.	Proportions, out of 1000 deaths.
1. Ipfwich-hamlet, Maffachufetts 10 years,	128 *furvive* 80 *years.*
2. Parifh of Holy-Crofs, Great Britain,	90. 91
3. Hingham, Maffachufetts---54 years,	75. 47
4. Connecticut---the whole ftate,	74.
5. Milford, Connecticut--12 years,	74.
6. Europe, *averaged*, according to Mr. Kerfseboom,	71.
7. The Pais de Vaud, in Switzerland,	46. 50
8. A country parifh in Brandenburg,	44. 44
9. Northampton, Great Britain,	40.
10. Breflaw, according to Dr. Halley,	34.
11. Paris, deducting children fent to the country; M. Buffon,	31. 84
12. Norwich, Great Britain,	31.
13. According to M. Buffon's *general* table,	27. 63
14. Berlin,	27.
15. Salem, Maffachufetts---1788, 1790,	26.
16. Philadelphia---1782, 1788, 1789, 1790,	25.
17. { London---according to M. Buffon, See note *(j)* { Do. according to Dr. Price,	{ 24. 56 { 16. 46
18. Edinburgh, do.	24.
19. Vienna,	15.

The proportions which the numbers of annual deaths bear to the whole numbers of the living---at the following places, refpectively; viz.

1. The Ifland of Madeira---	1 to 50
2. Salem, in Maffachufetts--- *(f)*	1 to 47
3. Philadelphia---The city and fuburbs,	1 to 45
4. A country parifh in Brandenburgh,	1 to 45
5. The Pais de Vaud,	1 to 45
6. 1098 Country parifhes in Germany,	1 to 43
7. The kingdom of Sweden,	1 to 38. 60
8. Montbard, in Burgundy--- *(g)*	1 to 36
9. France,	1 to 35
10. England,	1 to 33
11. The parifh of Holy-Crofs, near Shrewfbury, Great Britain,	1 to 33
12. Paris,	1 to 32. 50
13. The Dukedom of Wurtemberg,	1 to 32
14. Savanna, in Georgia---(b)	1 to 31. 70
15. Breflaw,	1 to 28
16. Berlin, (i)	1 to 26. 50
17. Northampton, Great Britain,	1 to 26. 50
18. { London, (j) { do. according to Dr. Price,	{ 1 to 26 { 1 to 20. 75
19. { Edinburgh---(k) { do. according to Dr. Price, { do. according to Mr. Maitland,	{ 1 to 26 { 1 to 20. 80 { 1 to 28
20. Amfterdam,	1 to 24
21. Rome,	1 to 23
22. Dublin,	1 to 22
23. Leeds, in Yorkfhire, Great Britain, (l)	1 to 21. 60

<center>H 2</center>

<div align="right">The</div>

The proportionate numbers of Annual Deaths, to 100 Annual Births; at the following places, respectively;—viz.

Names of the Places.	To 100 Births	N°. of Deaths.
1. Salem, in Maffachufetts, for 1782 and 1783—including the ftill-born in the number of deaths,	To 100 Births.	49. 00
2. Hingham, in Maffachufetts, for 54 years,	do.	49. 50
3. Philadelphia---City and fuburbs,	do.	50. 00
4. The kingdom of Pruffia, for 4 years, ending in 1718,	do.	57. 43
5. The Ifland of Madeira,	do.	58. 75
6. All the king of Pruffia's dominions in Germany, &c. exclufive of Pruffia; 4 years, as above,	do.	71. 00
7. The kingdom of Pruffia, in 1766,	do.	72. 50
8. Sweden, for 1774, 1775, 1776 and 1777,	do.	72. 86
9. France, from 1754 to 1763,	do.	76. 94
10. England,	do.	80. 00
11. City of Brunfwick, in Germany---1764 and 1767,	do.	80. 97
12. The Ifland of Corfica,	do.	81. 00
13. Manchefter, in Great Britain---1764, 1766, 1768, 1771, and 1777,	do.	82. 57
14. Dantzic---1717, 1718, 1720 and 1721,	do.	85. 77
15. Koningfberg---1766, 1768,	do.	87. 49
16. Duchies of Holftein and Slefwic---1765, 1767,	do.	88. 23
17. Whitby, in Yorkfhire, Great Britain---1767, 1768, 1772 and 1777,	do.	88. 45
18. Norwich, Great Britain---1768, 1774 and 1777,	do.	92. 96
19. Denmark and Norway, in 1764 and 1765; and do. including the Danifh dominions in Germany, in 1766,	do.	93. 17
20. Paris---14 years, viz. from 1771 to 1784.---M. de la Place,	do.	97. 65
21. Do.---22 years, viz. from 1745 to 1766.--M. de Buffon,	do.	99. 34
22. City of York and fuburbs, Great Britain---1768, 1770,	do.	100. 75
23. Paris, 1781, and 1782, M. de la Place,	do.	101. 24
24. Do. according to M. de Buffon,	do.	101. 36
25. Do. according to Dr. Price's ftatement of the numbers of births and deaths, there,	do.	101. 57
26. Copenhagen---1765, 1766, 1767, 1771, and 1772,	do.	101. 81
27. City of Freyberg, in Saxony---for a whole century, ending in 1717,	do.	102. 92
28. Paris---from 1764 to 1773, both inclufive, and 1775, 1778, according to Mr. Anderfon,	do.	103. 49
29. Chefter, Great Britain---4 years,	do.	107. 42
30. Liverpool, Great Britain---5 years,	do.	112. 70
31. Norwich, Great Britain---30 years,	do.	114. 09
32. Breflaw, in Silefia,	do.	119. 50
33. Vienna,	do.	121. 43
34. Copenhagen,	do.	122. 22
35. Northampton, Great Britain,	do.	123. 23
36. London---26 years.---From the bills of births and deaths, during that term,	do.	124. 92
37. Berlin---5 years, ending in 1759,	do.	131. 00
38. Rome,	do.	138. 43
39. Amfterdam,	do.	169. 56
40. do. from 1764 to 1768, both inclufive, and 1771, 1772,	do.	171. 95

No.

(a) Out of 198 deaths, in the congregations of Chrift-church and St. Peter's, from Chrift-mas 1781 to Chriftmas 1782,---24 died of the fmall pox, 21 of purging and vomiting, and 27 of fits and convulfions. The average number of deaths, in the fame congregations---during the years 1788, 1789 and 1790---is only 145; and not quite 145. 7-8, during the 22 years, from which the table for Philadelphia N°. 1 is formed--The deaths, therefore, in 1782, exceeded the average number of thofe for the 22 years, in the proportion of 136 to 100 : and, confequently, the year 1782 was unufally fickly in Philadelphia, as well as at Salem in Maffachufetts. In the year 1789, alfo (viz. from Chriftmas 1788 to Chriftmas 1789,) out of 164 perfons, who died in the congregations of Chrift-church and St. Peter's, 20 died of the meafles. From thefe circumftances, it is reafonable to fuppofe---that even the *fecond* table for Philadelphia gives the probabilities of life too low, for this city; becaufe, out of the *four* years above mentioned, one was more fickly than common ; and, during another, near one eighth of the deaths from which that table is formed, were occafioned by a diforder not annually epidemic.-----In the year 1782, there died between the age of 80 and 90 years, out of 198,---3 perfons; in 1788, out of 126,---1; in 1789, out of 164,----3; and in 1790, out of 145,---5; being, in the whole, 12 out of 633 : and this gives the proportion of 6 perfons, out of 1000, attaining to 90 years of age.

(b) The meafles having been very mortal at Salem, in 1783,---that year has been omitted, in calculating the proportion of deaths, for the firft twenty years of the ages.

(c) The number of deaths at Salem, exclufive of the ftill-born, during the years 1782, 1783, 1789---averaged 167$\frac{1}{2}$ per annum ; and the number of thofe who died between 80 and 90 years of age, during the fame term, averaged 4 per annum---This gives the proportion of thofe dying, between the 80th and 90th year of life, in that town, as 23. 88 out of 1000 deaths. The bills for 1782 and 1783 do not notice any deaths, *after* 90 years of age, and this is alfo the cafe, with the bill for 1789 : but, in the two former, the lifts of ages comprehend 36 deaths of "ages unknown," and, in the year 1790, three furvived 90 years of age.------See the table for Salem, for the year 1790.

(d) Out of 191 deaths, from which this table is found, two were between the age of 90 and 100 years, and 1 at 103 years.

(e) According to M. Buffon, the proportion of deaths, at Paris, in the two firft years of life, is 313, 21 out of 1000; and, at London, 334. 59, out of 1000. The number of deaths, he obferves, is greater at Paris than in London, from two years of age to five ; lefs at Paris than at London, between 5 and 30 years ; pretty nearly equal, in both cities, between 50 and 60; and much greater at Paris than at London, from the 60th year of age to the end of life --This fhews, continues M. Buffon, that *old age* is, in general, much lefs in London than in Paris : for, out of 1000 perfons, 212 died after compleating their 60th year, at Paris ; whereas, only 138, out of 1000, died after that age, at London.--The continual fupply of people, moftly from about twenty years of age and upwards, which great cities draw from the *country*, gives the proportion of thofe who die at *old age*, in fuch cities, much higher than the number of thofe *born* in them would give. Hence the favorable appearance, with refpect to longevity, which many great cities exhibit, is extremely fallacious : and this obfervation is particularly applicable to London, where the continual diminution of the number of its inhabitants, occafioned by the great excefs of deaths beyond the births, renders fuch fupplies neceffary, to fupport its population.

(f) The ftill born are included, in the number of deaths.

(g) This town contains, according to M. de Buffon, 2337 inhabitants.

(h) From the 1ft of July, 1790, to the 1ft of July, 1791, the number of deaths at Savanna, was in the proportion of one out of every 31 7-10 of the total number of *white* inhabitants (exclufive of Mariners and Sojourners) in that city. It appears by the cenfus, that, in January 1791, Savanna contained 1712 white inhabitants.---

(i) Berlin contains, according to Dr. Price, 134,000 inhabitants.

(j) Dr. Price fuppofes the proportion of annual deaths to the whole number of the living in Edinburgh, to be nearly the fame as in London---I have therefore given the proportion of one to twenty-fix, for both cities; and my reafons for affuming *this* proportion---which differs confiderably from that ftated by Dr. Price---will appear, in the courfe of the foregoing obfervations.---

(k) By the London Bill of Mortality, made up from the 16th of Dec. 1788, to the 15th Dec. 1789, it appears---that, in the 123 parifhes in London and Weftminfter, and the 23 *Out-parifhes* in Middlefex and Surry, 20,749 perfons were buried within the year. Of this number, thofe who died after compleating the feveral periods of age, after mentioned, give the following proportions, viz.

(l) This town contained, in the year 1770,---16,380 inhabitants   Out

Out of 1,000 deaths, there died---upwards of 100 years of age.		0. 48
Do.	90	3. 66
Do.	80	23. 66
Do.	70	76. 34
Do.	60	146. 46
Do.	50	227. 72
Do.	40	318. 95

These proportions correspond so nearly with those given by M. Buffon, in his estimate of the probabilities of life, for London, as to induce a belief, that the calculations of that celebrated Philosopher may be depended upon, in this instance.

N°. VIII.

Extract of a Letter from Andrew Ellicott, to DAVID RITTENHOUSE, *Esq. dated at Pittsburg, November 5th 1787, containing observations made at Lake-Erie.*

Read Nov. 21, 1788   ON the thirteenth of last month, while we lay on the banks of Lake-Erie, we had an opportunity of viewing that singular phenomenon, by Seamen termed looming. It was preceded by a fine Aurora-borealis, on the evening of the 12th——the 13th was cloudy; but without rain: about ten o'clock in the morning, as I was walking on the beach, I discovered something that had the appearance of land, in the direction of Presque-Isle; about noon it became more conspicuous and; when viewest by a good Achromatic-Telescope, the branches of the trees could be plainly discovered——From 3 o'clock in the afternoon, till dark, the whole Peninsula was considerably elevated above the horizon, and viewed by all our company with admiration.——There was a singular appearance attending this Phenomenon, which I do not remember to have seen taken notice of by any writer— The Peninsula was frequently seen double, or rather two similar Peninsula's, one above the other, with an appearance of water between:—the separation, and coincidence was very frequent, and not unlike that observed in shifting the index of an adjusted Godfrey's quadrant.——As singular
lar